Reviews

Geology and Mineral Resources of Kenai Peninsula, Alaska. By G. C. Martin, B. L. Johnson, and U. S. Grant. U.S. Geol. Surv., Bull. 587, 1915. Pp. 243, pls. 38, figs. 43.

This volume is a summary of what is known of the geology and mineral resources of the Kenai Peninsula, including both the results of the early investigations and the hitherto unpublished work of the present writers. In an introductory chapter Martin summarizes the geology of the general region; the succeeding chapters are devoted to a more detailed discussion of its several parts. The relations of highly folded pre-Tertiary sediments and associated lavas and intrusives of the Kenai Mountains are as yet imperfectly known. Rocks definitely assignable to the Triassic and to the Jurassic are known over limited areas, but the great bulk of the slate and graywacke series has not been differentiated. It may include upper Paleozoics and possibly some Mesozoics younger than the Jurassic. The Sunrise group of earlier writers probably represents the upper part of this series and seems to be more nearly equivalent to the Orca group than to the Valdez group in the Prince William Sound region. The only Tertiary beds of the Kenai Peninsula are those of the non-marine Kenai formation.

The gold lodes of the northern Kenai Peninsula are described by B. L. Johnson. The deposits are of three general types—fissure veins, stringer lodes, and mineralized silicic dikes. The veins occur in two distinct sets, standing approximately at right angles to each other and dipping at high angles. Both sets of fractures are ore-bearing and of about the same age. Their average thickness is between 2 and $2\frac{1}{2}$ feet. The present known vertical range of these veins is about 5,000 feet. Of minor importance are the stringer lodes, characteristically developed in the slates and graywackes parallel to the cleavage and bedding planes. Only slightly mineralized dikes have been discovered thus far. The mineralogical composition of the veins is simple and indicates deep-seated conditions of origin. Quartz is the predominant gangue mineral, Calcite is generally present and albite locally. Arsenopyrite, galena, sphalerite, and pyrite are the characteristic sulphides, arsenopyrite being most abundant. Chalcopyrite and pyrrhotite are less common.

Molybdenite is present at two localities. The gold occurs in the native state. The mineralization was subsequent to the intrusion of the Mesozoic granite batholiths and the related stocks and dikes. The depositing solutions were probably residual emanations from these magmas. The gold lodes of the Kenai Peninsula correspond, therefore, both in age and general association, with the similar deposits elsewhere in Alaska.

H. R. B.

Field Geology. By FREDERIC H. LAHEE. New York: McGraw-Hill Book Co. 12 mo, pp. xxiv+508. $3.00.

This work is divisible into two parts: an empirical treatment of geologic phenomena (twelve chapters), and a compilation of field and office methods (six chapters).

The first part covers well-nigh the whole field of phenomenal geology and will find its greatest usefulness among undergraduate students. For working geologists the most valuable matter will be found in the chapters on "Geologic Surveying," "Modes of Geologic Illustration," "Geologic Computations," and "Preparation of Geologic Reports," and in appended tables. One wishes that more of the field and office methods contributed in the last few years to economic geology were presented.

In carrying out the scheme of empirical treatment of phenomena the author has constructed many carefully analyzed "keys" or tables, like those of mineralogical and botanical texts. The reviewer has tried out the work in two field courses, placing it in the hands of the students simply as a reference, and has found it very valuable, though the students did not voluntarily make use of the "keys." These may find their usefulness among beginners without field association with more experienced men.

The author has digested pertinent matter from such works as Leith, *Structural Geology;* Leith and Mead, *Metamorphic Geology;* Grabau, *Stratigraphy;* Lindgren, *Mineral Deposits*, etc., and presents valuable material from the field handbooks of Hayes, of Farrell, and of Geikie. Important contributions to periodical literature have also been drawn upon.

The book is one of the McGraw-Hill series of limp-cover handbooks, with narrow margins and rounded page corners. Its 500 pages of thin paper will prove no burden in the pocket.

J. H. B.